

OBSERVATIONS

UPON THE IMPORTANT OBJECT OF

PRESERVING WHEAT AND OTHER GRAIN

FROM VERMIN, &c. &c.

OBSERVATIONS

ON THE HISTORY OF THE

INDIAN NATIONS OF THE

WESTERN PART OF NORTH AMERICA

OBSERVATIONS

UPON THE IMPORTANT OBJECT OF

PRESERVING WHEAT AND OTHER GRAIN FROM VERMIN,

WITH A SAFE AND EFFICACIOUS METHOD TO PREVENT THE GREAT
DEPREDACTIONS THAT ARE MADE ON THOSE VALUABLE ARTICLES.

CONTAINING ALSO,

SOME CURSORY REMARKS

ON THE NATIONAL ADVANTAGE ARISING FROM OUR
EXPORT CORN LAWS,

AND PROVING THAT THE SAME HAPPY CONSEQUENCES MUST BE
DERIVED FROM THE INCLOSURE OF OUR

FORESTS, COMMON FIELDS, AND WASTE LANDS;

WITH A CALCULATION ANNEXED,

Demonstrating the great Savings which may accrue from the Use of the

PATENT ARTIFICIAL SLATE-FRAMES,
ON HAY STACKS.

BY SIR JAMES WRIGHT, BART.

DEDICATED BY PERMISSION TO HIS MAJESTY.

Printed by COOPER and GRAHAM, BOW STREET, COVENT GARDEN.

Sold at the Artificial Slate Manufactory, Woodford Bridge, Essex; at Teingmouth House, Devon; at Hawkestone Inn, Salop. And in London, at Mr. Moore's, Jeweller, New Street, Covent Garden; at Mr. Vardon's, No. 295, Holborn; and at Mr. Richmond's, Bookfeller, No. 123, Jermyn Street, St. James's, where Specimens of the Artificial Slate, the Pipes, Models of the Safe-Guards for Corn-Stacks, and Pendant Frames, may be seen.

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1796.

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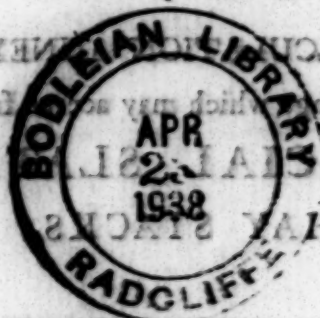
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~~TO HIS MAJESTY.~~

TO HIS MAJESTY.

SIR,

OBSERVATIONS upon agriculture naturally look up to your Majesty for protection, and you have graciously allowed me to present them; however imperfectly they may be executed, your known benevolence, Sir, will excuse the attempt, as it earnestly, though humbly, aims at public good. I have to lament that the dignity of the subject is not treated with such merit, as to be worthy your Majesty's acceptance; but, I flatter myself, the willing efforts in so good a cause of any of your subjects, will be received with that indulgence, which his limited capacity requires, and which your Majesty's unreserved condescension so liberally and so constantly bestows.

I feel, Sir, I shall be exempt from the crime of adulation, in asserting, that one of the greatest blessings this kingdom has ever received from its most enlightened sovereigns, is that noble and judicious establishment, which your Majesty's partiality to, and intelligence in agriculture, has induced you to erect and patronise. A Board of Agriculture so wisely appointed, cannot fail of bringing to the highest perfection this vast resource of our national wealth and power.

I am the more confirmed in this opinion, from the observations I have made, during more than thirty years, in which I have enjoyed the honor and happiness of being in your Majesty's service near your royal person, that there is a noble perseverance in your Majesty's mind, calculated to bring to perfection all those undertakings which appeared for the public good. Under these impressions, Sir, I hope it will not be too presuming in me to lay my mite of assistance at your Majesty's feet, in so great a concern as the preservation of that grain, which is so suc-

cessfully multiplying, for the blessing of our country, under your Majesty's fostering hand and wise protection.

Hoping that your Majesty will permit this humble tract to shelter itself under the royal auspices of so great and so good a husbandman,

I am ever,

Royal Sir,

Your Majesty's

Most devoted, much attached,

Most dutiful and

Obedient servant,

RAY HOUSE,

ESSEX,

February 11, 1796.

JAMES WRIGHT.

certainly multiplying for the blessing of our country, under your Majesty's labelling hand and wise protection.

Hoping that your Majesty will permit this humble tract to meet with under the royal and pieces of so great and so good a patronage.

I am ever

Most humble

Your Majesty's

Most devoted servant

Most humble

Objection

1711

JAMES WATSON

OBSERVATIONS

ON

HAY and HAY-STACKS.

THE correspondence I have been engaged in, for these few years past, with several very ingenious and intelligent gentlemen and farmers, relative to my method of covering hay-stacks, with *pendent frames* of the Patent Artificial Slate, and their adoption of them since, for their wheat-stacks, has made me acquainted, to my great concern, with the surprising ravages to which, not only so very valuable an article of life, but also barley and every other species of grain are subject, from rats and mice, in almost every progressive state from the field to the mill. Many concurring circumstances have made me reflect, that the Artificial Slate may be so compounded and modelled, as to become a perfect **SAFE-GUARD** for grain against the depredations of these ravenous **vermin**.

A gentleman of fortune, and an excellent farmer, in Lincolnshire, who keeps several hundred acres of his estate in his own

cultivation, (and has done so for many years) has lately had a very large quantity of the Artificial slate, not only for covering his hay-stacks, but also those of wheat. I think myself exceedingly obliged to this gentleman for such a discovery; the great advantages of which, in lieu of thatching wheat with straw, I confess never struck me before.

NO

By way of Prelude to this little Treatise, I shall shew the great utility and economy of this material, when made into *pendent frames*, to cover hay-stacks, which I hope will be fully and satisfactorily ascertained by the following estimates.

Calculation of the different Savings by the Use of the Artificial
wet slate for the use of **Slate Hay-frames** *THE correspondence in the*
 Farmers are generally deterred from adopting great and im-
 proving discoveries in agriculture for want of money; other-
 wise this excellent and economical invention of the hay-frames
 would be universally in practice. But those who can afford the
 first cost are soon convinced of the astonishing advantages arising
 from the use of them in a few years; in many particulars, as will
 incontestably appear by the trials of the frames, which have
 already been made, and by the following observations and esti-
 mates.

First, it must be observed, a constant use has been made of
 them at Ray-House, in Essex, for these last twelve years: they
 are still in useful condition, and with very moderate annual re-
 pair, it is probable, they will last twelve years longer: it is not

unlikely, that at the expiration of that period they may still be serviceable for the same purpose; but on the term of 24 years only, the following calculation is made.

We have certainly experienced a surprising advantage from the frames upon all the washed bad hay from the fields; for as our hay harvest lasts from six to eight weeks, it is impossible to avoid having every year many loads of washed hay, which are apparently ruined by occasional rains, and would be inevitably so, without the use of the frames: many loads per annum of this kind of hay (as we make from 300 to 500 loads, or tons per annum), without this expedient, would be good for nothing but dung, both flavor and color being totally gone; but even this bad stuff, which no human foresight can save from such accidents, is rendered as good and as perfect as the best, both in color and flavor; and this is effected by the frames in the following manner.

All this washed hay, as it becomes dry, is carried to the stack-yard, formed into large temporary cocks, and covered with some loose frames; and when the stacks are making, this washed hay is equally divided amongst them all, and used for *topping up only*, and the fermentation of the good hay below gradually sending up its vapour through the washed hay, it becomes by this operation as completely restored as the best hay, and gives it color and flavor similar to the rest, and sells in the market for an equal price.

By this natural operation the washed hay above receives into its exhausted tubes the superabundant goodness and moisture,

which the good hay below cannot contain, and which it is always obliged to get rid of by evaporation.

It must farther be observed, that in the year 1792 it was remarkably wet: during the whole of the hay harvest there were scarcely three days together for six weeks without rain, and more musty hay was made within 20 miles of London than had been known for many years: much was obliged to be converted into dung, and the greatest part of the hay that was sold in White-Chapel Market, (of that years making), did not sell for more than 30 shillings per ton or load, some few only excepted, but all from Ray-House was sold for 3l., and a good deal for 3l. 10s., and 4l. per load.

Had it not been for the hay-frames, as will evidently appear from the following statement, (which was done in consequence of the above-mentioned annual practice), the same fate which befel that of our neighbours in 1792 must have affected all the hay at Ray-House. Therefore at the lowest calculation that year, in this particular, at least 300l. was gained, and this, over and above what would have been the case had there been no frames used; for they not only act as preservatives to the good hay, but they perfectly restore the washed and damaged hay, when become so in the field, as will evidently appear from the foregoing operation.

Although I have made considerably less hay this year* than usual, only a little more than 200 loads, yet from the general scarcity of well-gotten-in hay, and a scanty crop, it is now at a

* December 20, 1795.

very high price. My neighbouring farmers have sold most of their hay of this year's growth only for 2 guineas per load; of the last harvest, yet they have the same kind of land, they have had the same unfavorable season, and the same art and caution of making their hay as myself; but they have had no *pendent Artificial Slate Frames* to restore their washed hay. Had I been unprovided of this contrivance I must have sold 120 loads of my hay (the quantity I made of washed hay), only for 340 guineas, like my neighbours, whereas that same quantity is now selling at the rate of 600 guineas; and probably as I have been selling some time at 5 guineas and an half, the 200 loads will produce 1000 guineas, before it is all sold, in lieu of 750, for good hay rises considerably every market day.

It must also be remembered, that four or five men will cover a large hay-stack of 40 or 50 tons with these frames, in as many hours, as the other require days to thatch with straw; three or four hours is full sufficient.

It is observable also, that the wear and tear of the frames are very trifling, though a large allowance is made in the estimate.

A considerable saving results from no musty hay ever forming in the stacks, because every night, whilst a stack has been making, and not topped up, the frames are occasionally laid on, and not taken off till the morning. Or, if a few days rain intervenes, the frames are immediately laid on, as a temporary *safe-guard*; and this saving cannot be put at a less valuation, on an average, than 10l. per stack. For every one knows it very frequently happens that, when 30 or 40 tons of hay is made into a stack, and not topped up, a hard shower of rain comes on, and almost the

whole of the stack is inevitably ruined, unless it be housed in a Dutch barn, which every intelligent farmer explodes; and under a fail-cloth hay is not adequately protected from much rain: therefore the savings on the 8 stacks in this instance are also very great, as appears by the Second Article of the Savings.

Estimate according to the Prices of Labor, and Materials in this Neighbourhood.

	£.	s.	d.
To 3 loads of straw to cover a stack of 40 tons, at 2 guineas per load, (the average price we pay at hay time, though it is sometimes 3 guineas per load)*, - - - - -	6	6	0
Thatching 17 squares of roofing, at 1s. per square, - - - - -	0	17	0
To small beer, 2 men, 4 days, 24 gallons, at 5d. per gallon, - - - - -	0	10	0
To 8 quarts of ale, at 5d. per quart, - - - - -	0	3	4
To spars for one stack, - - - - -	0	4	0
	†8	0	4

* Probably this year it will be much dearer, being to-day (20 Feb. 96) 3l. 1s. 6d. per load in the Hay-market.

† This calculation must comparatively diminish, according to the price of labour and materials at a distance from London, which probably are more moderate.

Estimate of one Artificial Slate Frame.

	£.	s.	d.
To a deal carcase case, 8 feet by 4, - - -	0	3	0
To 12 Artificial Slates, at 1s. - - -	0	12	0
To paint for ditto, - - -	0	0	6
To cement for ditto, - - -	0	0	6
To nails, staples, and labor, - - -	0	1	0
	0	17	0

To 60 of these frames, at 17s., to cover a stack of

40 loads, or tons, - - -	51	0	0
To ridge pole to each stack, - - -	1	0	0
To repairs per annum per stack, - - -	0	5	0
	52	5	0

To 1 stack covered with straw, containing 40 loads,

for the first year, - - -	8	0	4
To ditto the second year, - - -	5	0	4
	13	0	4

Average per annum, - - - 6 10 4

The straw left, of the first year, will be worth 2l. for covering again; and the remainder not useful for that purpose will produce litter and dung worth 1l.; of course every second year the stack will cost only 5l. os. 4d.

First Twelve Year's Savings.

	£.	s.	d.
The amount of thatching one stack of hay with straw for 12 years, at 6l. 10s. 4d., is - - -	78	4	0
Eight stacks of hay are made on an average per annum at Ray-House, consisting of 320 loads or tons, of course for 12 years they would cost, 625	12	0	
Deduct covering 8 stacks with the Artificial Slate frames for 12 years, at 52l. 5s. cost, - - -	418	0	0
<i>First Saving,</i> — — —	207	12	0

Second Saving.

At least 10l. per stack on an average for 11 years* is saved, on account of no musty hay ever forming in the stacks, for the reasons as above recited, and because the frames preserve them from any accidents of rain, - - - - -	880	0	0
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Third Saving.

The extraordinary saving in the year 1792 as alluded to above, and which may again happen, at least, once in the next 12 years, though this probability is not reckoned †, - - - - -	300	0	0
Carried over	1387	12	0

* Vide next page.

† Since this Treatise was written in Feb. 1795, the last summer has been as wet, as that in 1792; of course what was then thought to be only probable, has proved a certainty.

Brought over £. s. d.
1387 12 0

Fourth Saving.

On the washed damaged hay in the field, which
had lost both color and flavor before it was
brought to the stack, at least 5l. per annum
per stack, for 11 years*, as above alluded to, 440 0 0
1827 12 0

Deduct interest of 418l. at 4l. per cent. per annum,
for 12 years, on first cost of frames †, - - - - 194 12 9
1632 19 3

Fifth Saving.

Accumulated interest on the above annual savings,
at 4l. per cent ‡, - - - - - 331 4 0
Total and actual savings on the last twelve years, 1964 3 3

Savings on the Second Twelve Years.

Sixth Saving.

Cost of covering 8 stacks of hay with straw for
12 years, as above, at 78l. 4s., - - - - 625 12 0
Carried over 625 12 0

* The year 1792 not being included in these two articles, is the reason they are estimated at 11 years only.

† Although this sum of 418l. diminishes annually, on account of the 6l. 10s. 4d. paid annually for thatching each stack, yet the interest is calculated on the whole amount of the frames for the whole time, and which is still in favor of this economy.

‡ The accumulated interest is calculated at 4l. per cent. on 11 years only, as the amount of the last of the 12 years cannot be sold, and money received, within the 12 years.

	£.	s.	d.
Brought over	625	12	0

Seventh Saving

Saving at least 10l. per stack, on an average, for 12 years on the 8 stacks, as before mentioned	960	0	0
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Eighth Saving.

Saving on the washed, damaged hay in the field, as before mentioned, at 5l. per stack for 12 years,	480	0	0
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Ninth Saving.

Accumulated interest on the second 12 years *,	470	0	0
Actual savings on the first 12 years, brought over from page 9, - - - - -	1964	3	3

Tenth Saving.

Compound interest on the first twelve year's sav- ings of 1964l. 3s. 3d. at 4l. per cent., from the end of the first 12 years to the completion of the 24 years, - - - - -	1180	4	1
	5679	19	4
Deduct for painting the frames, in the course of the 24 years, three times, - - - - -	36	0	0
Total of actual savings in the first 12 years, and probable ones in 24 years, - - - - -	5643	19	4

* Vide the preceding page.

When first the ingenious gentleman, above alluded to, wrote to me on the subject of the hay frames, he candidly confessed to me, he had repeatedly, (but *unsuccessfully*) endeavored to form some *pendent frames* of different materials of his own invention, but that all were attended with insurmountable difficulties, and generously informed me that he esteemed the principal value of the Artificial Slate frames to arise, not so much from their comparative savings, in opposition to the mode of thatching hay with straw, (which nevertheless he confessed to be great) as from their securing all sorts of grain, especially wheat, *so speedily and efficaciously*, from the risk of sudden changes of the weather, and at the same time *so soon setting at liberty*, at a precious and busy time of the year, many very useful hands, which otherwise must unavoidably be employed in thatching stacks of grain with straw; an operation slow in itself, and subject to be interrupted by the inclemency and variation of the seasons. In this view, he says, the Artificial Slate frames have very great and peculiar value for all grain, in addition to the other advantages visibly proved already by their use on hay-stacks.

It evidently appears from the above-stated calculations and comparisons, that in the last 12 years, the sum of 1964l. 3s. 3d. has been saved on 8 stacks of hay at Ray-House, by substituting these frames in lieu of thatching, and on a probability, which nearly amounts to a certainty, these useful and economical safe-guards, with care and inconsiderable repairs, will last 12 years longer; in that case the gain in 24 years must amount to the enormous sum of 5643l. 19s. 4d. as above calculated.

OBSERVATIONS

ON

VERMIN.

SINCE the Artificial Slate has been adopted for the covering of wheat and other stacks of grain, I have, from the intelligences I have collected of the great losses sustained from vermin, turned my thoughts a good deal towards compounding a sort, and forming a model, to prevent rats and mice resorting to the stacks of these valuable articles; and I feel convinced in my own mind, from the experiments I have already made, that corn-stacks of every denomination may be effectually guarded against the depredations of all sorts of vermin by means of this material.

The accounts I have heard, during my enquiries, of the sagacity of rats, especially when collected together in a body, are almost beyond credit; however I shall relate the following incidents which I have received from what, I think, very good authority.

My own bailiff, who has lived in my house above 20 years, and who is a man of known veracity and integrity, and not less

esteemed for his knowledge in his line of business, has assured me, that just before he came into my service, whilst he lived upon a farm belonging to the late Duke of Bolton, in Hampshire, a very sensible and reputable Cooper, from the neighbouring town, was coming to the farm on business, one morning a little before day-light, when he suddenly heard in the high road before him a strange chattering noise, something like that of magpies, but rather of a more dumb accent. As he walked forwards, he discovered by the dawn of the morn, the noise proceeded from some hundreds of rats, who were advancing towards him, and as he approached nearer, they all raised themselves upon their hinder legs, and darted towards him with the utmost resolution, and continued their pursuit of him a considerable distance, but by his superior speed he got clear off from them.

Another instance of their courage, was related to me by an old friend of mine, whose authority I cannot doubt, (for I have never known him deal in the marvellous), who assured me, that some years ago a gentleman of his acquaintance, of great respectability, on whom he could perfectly depend, informed him he was going out a shooting one morning before day-light, and that he saw confusedly at a small distance from him, something moving across a stubble inclosure, of a darkish color, covering no inconsiderable extent of surface. As he approached nearer the object, he found it consisted of a great assemblage of several thousand rats progressively going on before him. He fired his piece at this great multitude of little animals, when to his astonishment, they all turned round upon him in a body, and he found no other security than in flight, which probably would have been fruitless, had he not taken his course over the next field, which fortunately was full of long tufted grass and mole hills, which so impeded

their pursuit of him, that he got clear away, or he might have fallen a sacrifice to this irritated host of enemies.

Another remarkable instance of the sagacity of these animals, is what Dr. Morgan of Somersetshire has related. As he is a gentleman of distinguished honor and abilities, I cannot doubt of his assertions: he says he took every possible care that no vermin should get to his wheat stack; he was very cautious that no rake, fork, or other implement should ever be laid against the sides, and had so fortified the staddle posts, that there was not any probability of these vermin gaining admission into the stack from the bottom; nevertheless, though all these precautions had been taken, there was a certain indication, (before the taking in the sheaves for threshing), that there were some rats within the mow. In consequence of this suspicion, a constant watch was made for several days and nights to find out how these animals got into the stack, when, to their great astonishment, several rats were seen to climb up the trunk of a large tree at several yards distance from the stack, from which one branch projected and hung over the roof of the stack; but there were above three yards from the extremity of the branch, which hung over, to the roof of the stack; from this extreme point these animals were seen to drop upon the stack. How the sagaciousness of these animals is to be accounted for, in this extraordinary instance, I must leave to the Philosopher and the Naturalist to investigate. It seems almost incredible how the first rat made this exertion to get at the wheat, as well as how he could communicate his success to his followers; for on opening the stack several hundred were found in it, and had nearly devoured all the wheat it contained.

The first circumstance that lead to a discovery that there were

rats in the stacks, was, that these little sagacious animals, whenever it had rained, always came to the sides of the stack, to lick the moisture that remained after each shower,

Extract of a letter conveying some intelligence on this subject, from Thomas Hoskins, Esq. of Hazlemey, Somersetshire, whose brother married one of the sisters to the Speaker of the House of Commons,

“ Mr. Hoskins, with his best compliments, desires me to acquaint you, that mice do infinite mischief in this country ; he remembers to have seen near 1500 killed from one rick belonging to the late Mr. William Warne, of Coker, near Yeovil.”

However that the public may run as little risk as possible from my zeal or predilection for my own invention, I mean within two years from the date hereof, that every farmer who chooses to be at the expence of covering his stacks with the *Artificial Slate Frames*, shall receive from my manufactory, as many hundred Artificial Slates, *gratis*, as may be necessary for the formation of my PATENT SAFE-GUARD AGAINST VERMIN, to every stack so covered ; provided, nevertheless, that such farmer shall be recommended by the ingenious and praise-worthy President of the Board of Agriculture, and that he solemnly promises to follow the model which shall be given him, *gratis*, as well as the printed directions which will be delivered him, for putting this improvement into due execution, and that he does not apply these *prepared slates* to any other purpose.

But if any farmer does not choose to go to the expence of covering his stacks with the *patent pendent frames*, he may purchase

as many of the *prepared slates* as he thinks proper, at the price of the common slates, and a model will be delivered with them, *gratis*, for forming the SAFE-GUARD.

The platform of this safe-guard, on which the stack of grain is placed, is divided into partitions, which fit into the frame-work of the foundation, on which the stack is placed, and probably by the time the season comes for the farmer's flock of sheep, bringing forth its lambs, the corn will be carried into the barns for threshing; when that is the case, these partitions will form into an excellent shed for the ewes to lamb under, which every sheep farmer knows is of no inconsiderable consequence, for that branch of farming, and as they are portable, they may be easily conveyed to any part of a farm most convenient for the lambing of the ewes.

It is worthy of remark, that these partitions of the safe-guard which form the bed of the corn stacks, not being wanted, either as sheds for the ewes to lamb under, at the time of hay harvest, or until the wheat harvest is over, may be very lucratively employed during the whole of the former period, as temporary pendent frames for securing the hay while it is making, both in case of sudden rains, and at night, and for the valuable purpose of restoring the washed hay from the field, as above-mentioned: for that salutary fermentation will have subsided in the hay stacks before the partitions will be wanted for the corn stacks.

Besides, if it is intended to thatch the hay stacks with straw, these substituted pendent frames may be usefully applied to the roofs of the hay-stacks, and remain there till the corn harvest is over; by which time, straw will be much cheaper; the price of

it being always at the highest at hay harvest, when the stock of the preceding harvest is nearly consumed, and the new one not yet come in. In this light, these portable frames may be economically employed, as well as for several other rural purposes, where materials may require to be kept dry. The Artificial Slates are so laid on these partitions for the bed of the wheat stack, that when 4 are inverted to form into a square, and they are laid outward to the air, the water will shoot off from them when employed on a roof, as well as from those *pendent frames* that are constructed on purpose for the roofs of stacks.

To the President of the Board of Agriculture, I shall also send a quantity of copies of this treatise to distribute, *gratis*, to those farmers, to whom he may think it useful to peruse this little tract.

I shall endeavour in the following remarks, to adduce such hints and arguments, as may lead the intelligent farmer, seriously to consider of what vast consequence it is to himself and the community at large, to preserve the grain with which a bountiful providence blesses us, as well as to increase and multiply it, by every exertion of labor and ingenuity.

It has been universally allowed, both by the speculative lover of agriculture, as well as the practical farmer, that the loss sustained to the public, from the ravages of rats and mice on all grain, especially those valuable ones of wheat and barley, both in the stack and in the barn, is very astonishing: what the maritime counties lose, is beyond calculation, though perhaps some of the inland parts are inconsiderably affected by these vermin; whole droves of rats have often been known in the dead of night, to

march, if the expression may be used, from one mow to another, laying waste the country round.

The ingenious and speculating Sir Richard Hotham, of Suffex, who seems an excellent farmer, and who keeps several hundred acres of his estate in his own hands, the greatest part of which is arable, has favoured me with his opinion and calculation on the article of vermin, of which the following is an abstract from his obliging letter on that subject.

“ My bailiff says, we kill 450 large rats per year at least, full fed, and he supposes each rat eats full an ounce of corn per day: I calculate from this position, and hold it fair to suppose on an average, the barns contain corn $\frac{1}{3}$ part of the year, say 120 days, which multiplied by 450, makes 54,000 ounces. I reckon in my parish, at least, ten such farmers, so that the consumption by these vermin in my parish, is 540,000 ounces.

Now out of 10,000 parishes in England and Wales, I deduct half for city and town parishes that grow no corn, then multiply my parish loss by 5000, and the product will be 2,7000,000,000 ounces, which I conceive to be equal to 168,750,000 lbs. weight, which divided by 56, the weight of a bushel of wheat, will make a loss of grain throughout the kingdom, of 16,850,000 bushels, which is far more than the seed sufficient to sow the succeeding season.”

I am much obliged to my worthy friend Sir Richard for his intelligence, which furnishes some probable data to form tolerable conjectures upon; but in addition, I must beg leave to observe, that he has *only* calculated what the dead rats had eaten of his

corn; we may suppose the living ones that evaded his bailiff's traps, must have destroyed a great deal, though not so much as the dead ones had. A considerable addition must be made to this statement, on account of the consumption created by the rats that escaped; besides I rather believe the quantity eaten by each rat, must have exceeded one ounce per day, as I procured a half-grown rat, and kept him seven days and a half upon wheat; when he eat eight ounces; not having been able to get a large full-grown rat, I could carry my experiment no farther; but many farmers and gentlemen, whose conjectures I have received upon the subject, all think a full-grown rat will eat much more than supposed by Sir Richard Hotham.

I have received a very obliging and sensible letter from Colonel Taylor, of Denbury, in Devonshire, who has long been a farmer, and to his honor and credit, he is one of the most respectable and intelligent members of the Agricultural Society in the Southern district of that county; I have conversed with few gentlemen, so well informed in rural concerns (and indeed in most others) as Colonel Taylor, therefore I look upon his conjectures as nearly amounting to certainty on this subject; an extract of which, he has allowed me to include in this treatise.

“Dear Sir,

“The depredations of those voracious animals, are greater I believe in Devonshire than in any county in England, and I am thoroughly convinced, that at least one eighth of the produce (and particularly of wheat) falls to their share: this is owing, principally, to the pernicious custom of having on every poultry farm, a sufficient quantity of barns and outhouses to contain the greater part, if not the whole of their harvest. Our farmers bring even as much

of their hay as they possibly can into the lofts (which they call linhays) by which, half of it becomes mouldy and stinking."

"Our barns are commonly built with loom and straw, tempered together, (called cob) or, of coarse hollow masonry; these buildings in a few years become perfect honeycombs, and swarm with vermin; on threshing, you may generally find all the lower tiers of wheaten sheaves, and those nearest the side walls, perfectly cleared without the assistance of the flail. Our farmers are not the only sufferers by this bad husbandry, but the landholder, who generally repairs, pays most heavily for keeping up buildings, the destruction of which would equally benefit both himself and his tenant; but the fore-fathers of our farmers had barns to hold their corn, and they will have the same now.

"Rats, it must be observed, will not touch any other grain, when they can get wheat. I am, dear sir, &c."

I have conversed with several intelligent persons in the farming line, in Devonshire, in Hants, and Wiltshire, and all seem pretty generally to agree, that one eighth is the proportion of grain devoured by rats and mice; and from the data given me by my ingenious friend, if admitted, (and I think it reasonable to be received as such) his conjecture will tally pretty nearly with the other counties I have mentioned; for he makes the consumption from the rats he has killed, amount to one sixteenth, and it is but reasonable to suppose, those vermin that escaped, devoured a great deal, which will bring it perhaps to about one tenth.

Mr. James, a very intelligent steward at Powderham Castle,

Devonshire, has written to a friend of his, at my request, on the article of vermin; he says as follows:

"I presume, that I speak within compass, when I inform you that for the last ten years we have destroyed about 300 rats per year in this house only; an amazing number of animals which must feed on something."

Therefore to secure completely these important articles of wheat, barley, and other grain, I should propose not only to cover those stacks which contain them with the Artificial Slate PATENT PENDENT FRAMES, in the same manner that hay-stacks are done, as above related, but to underline the boards on which the sheaves are deposited, and to carry a parapet of the prepared slates all round each stack two feet high, according to the model I have invented for this SAFE-GUARD.

By these means I think every grain of corn may be completely secured, and be kept sweet to the latest period of the winter season, or longer if necessary, which in barns it cannot be. Besides, all the *cavings* or waste of the sheaves will be preserved, from falling to the ground, by means of this close floor to the *safe-guard*, and be profitably employed for feeding swine and poultry,

It is necessary to observe, that the ingredients I have introduced into these prepared slates, are noxious both in smell, taste, and substance, to all vermin, though not so to the human species. It may not perhaps be unsatisfactory to the curiosity of the public to trace the origin of this invention to its source, and what gave the first rise to it.

During my residence of 18 years as His Majesty's Minister at Venice, I had often observed with much pleasure, as well as surprise, that all those rooms in my house which had stucco floors, called there, *Terrazzi*, were free from bugs, fleas, and other small reptiles. Upon investigating the cause, I was convinced it proceeded from what the people, who are called *Terrazzieri*, (and are the persons that come once a month to polish these floors) make use of for that operation.

Some years after my return to England, I had a mansion-house upon my estate in Essex to repair; it had long been the jointure of an old lady, and much neglected, especially the chambers in the offices which are detached from the house: probably they had not been inhabited for some years, and when I went into them with my surveyor, we found millions of worm hills all over the boards of every floor, of course they were all condemned to be taken up and new laid: however, recollecting the ingredients used so efficaciously on the terraces at Venice, I determined first to try the experiment, and was not disappointed in my expectations; the old floors were soon free from worms, and it is now 19 years since I let the house to Nic. Pearse, Esq., from whom I have never received the least complaint.

After this I tried the same experiment with equal success, on the backs of several old pictures that were painted on wood, where the worms had been very busy.

Some years ago the Duke of Queensberry, who had frequently ordered the Artificial Slate from my manufactory in Essex, for his house at Aimesbury in Wiltshire, wrote to me for some to line a granary there, if I thought it would be proof against the rats. I

informed his Grace I believed I could finish some slates with ingredients, that probably would be efficacious, but that I was not certain, though I knew reptiles of a lesser size would not come near them. Encouraged by this probability of success, his Grace ordered a quantity of the Artificial Slate prepared with these ingredients, which were the same as those used for polishing the stucco floors at Venice. Some few years after the Duke informed me, not a rat had been seen in the granary ever since the application of these *prepared Slates*.

In consequence of this experiment, all the Artificial Slate, that has been sent out to the East and West Indies, where the white ant makes such devastations on the timbers of the houses, has been manufactured with the same ingredients, and no complaints have arrived from those quarters.

After I had flung together these imperfect remarks, and had determined to request the Public to give them a favorable reception, I wrote to the Duke of Queensberry to beg he would inform me whether the Artificial Slate I had sent him some years ago to line his granary, still continued to answer his purpose. His Grace obligingly sent me the following satisfactory answer:

“*Piccadilly, Jan. 15, 1795.*
“The Duke of Queensberry presents his compliments to Sir James Wright, it is long since he has lived at Aimesbury; but in regard to all the qualities of his Artificial Slate, he has no occasion to think but it answered very well.”

In the trials above alluded to, I have only used the Venetian ingredients on the surfaces of the Artificial Slate, but in what I

have now manufactured for the SAFE-GUARDS against vermin; I have connected them in the body of the Slaters: there are also other powerful ingredients superadded, which I have every reason to believe will totally prevent these destructive animals from penetrating into, perhaps even approaching, any stacks of corn that shall be provided with them.

I must here beg leave to offer my best thanks to those two valuable characters, the Speaker of the House of Commons, and my worthy and benevolent kinsman, Sir Richard Hill; who, being ever anxious to promote any public good, have cheerfully lent me their best services in this business; and in no instance has their good will been more useful, than in recommending me to the kind offices of the ingenious President of the Board of Agriculture, who in the politest manner supplied me with every document, on the subjects of this little tract, that had been communicated to that useful establishment; therefore to Sir John Sinclair I feel the greatest obligations.

I cannot help observing in this place, that amongst the many blessings we owe to His Majesty, none are more likely, in its consequences, to be of greater national utility, than his encouraging and protecting this very important office. The love as well as the knowledge which His Majesty possesses of agriculture does honor both to his head and his heart: can there be a more noble employment, even in the most exalted personage, than that of protecting and communicating such discoveries in agriculture as must be so materially beneficial to mankind? especially to the poor, that valuable part of the whole, which calls aloud for our care, our protection, and our indulgence: and I doubt not but future ages will have sufficient cause to bless His Majesty's penetration

in selecting a society of such respectable members, who all seem actuated by real motives of patriotism, the true love and benefit of their country; and it is devoutly to be wished that their present liberal-minded and active President may long be preserved, to complete that zeal and attention, which he so constantly and warmly exerts for the benefit of this noble undertaking, for which he cannot be sufficiently applauded, perhaps never surpassed, and rarely equalled.

In order that the Public may feel the great importance of this subject, which at the first blush may not so forcibly strike them, I shall, with great deference to abler calculators, make some probable estimates on the losses sustained by the kingdom from vermin; and lay before them what intelligences I have been able to collect, as well as some abstracts from the Reports of the Board of Agriculture, which Sir John Sinclair has kindly favored me with, and which indicate how injurious vermin are supposed to be in those counties from whence they are sent, though they are not properly maritime counties, the Severn only flowing by small parts of their coasts.

In the general review of Agriculture from the county of Gloucester, and in that from the county of Somerset, it is reported how *exceedingly detrimental* these animals are considered in those parts, by the intelligent in Agriculture. How much more must they be in those counties contiguous to the sea, and abounding with sea-ports.

Gloucester Report. Article, Vermin.

“ Rats and mice do a great deal of mischief in this, and I suppose in every other part of the kingdom. Rat-catchers in general are almost as great a nuisance, and it is probable encourage rather than lessen these destructive vermin. A plain and efficacious plan for the extirpation of these destructive vermin, would be a great national benefit.”

Somerset Report. No. II.

“ The depredations of these *vermin* (*rats*) are too important to be overlooked. A sensible farmer of my acquaintance thinks that by them and birds a 30th part of the corn in the kingdom is devoured. Corn in barns they have free access to, and it is very difficult to keep the mows free from them: if they are not brought in from the field, a stick, or rake, a pike or any other body carelessly against the mow will introduce them; destructive therefore as they must be, it behoves all farmers to make their slaughter a general concern, and it may be done by a parish rate.”

I beg pardon for dissenting from the ingenious author of this report; but I fear a parish rate would be insufficient to elude the cunning, the dexterity, and even the resolution of these animals; besides, the great augmentation within these last years of parochial taxes, has been such, as would make this a method exceedingly unpalatable to the community, who in general have not so great

a predilection for either farmers or agriculture, not to mention that the majority in parishes are little interested in these concerns. I cannot devise a better medium, than totally to deprive these reptiles of their wonted support and nourishment, and it is hoped the contrivance of the proposed PATENT SAFE-GUARD will effect it. If it should be so fortunate as to succeed, it is almost beyond our conception, what an enormous sum must be saved to the community; for when the grain is deposited in these protected stacks, none of it need ever be taken from them, except a necessary quantity for a days threshing out.

However, if the mows should, for sake of convenience, be obliged to be formed at a distance from the threshing barn; it is only required to line it breast high, as was done at the Duke of Queensberry's, at Aimesbury, and the vermin will not approach it.

It is proper to observe, that it may sometimes be very beneficial to farmers, where there are excesses in the annual crops, to stow up their corn in the mows to a late period, in order to reserve it for the bounties on exportation; for some counties produce more grain than they can consume or their markets take off, and if in a plentiful year the farmer has not the opportunity of an early sale, it may be dangerous to keep his corn too long in the granary, even where the rats cannot penetrate, because we know that all corn in heaps, especially wheat, is very susceptible of a strong fermentation, from which the weevil is generated, so detrimental to corn in general, if it is not frequently turned over. But in the sheaf, and in the stack, we know it will always keep sweet and free from the grub. This preservation of corn in the stack may often prove a valuable convenience to those dealers, who are largely concerned.

in the export trade ; and who may often be necessitated to wait for shipping, and be subject to other unavoidable delays, to which a foreign commerce of any kind is often exposed, and in these cases it is a beneficial circumstance, to be able to keep the corn secure for a length of time.

A very sensible and experienced farmer, particularly conversant in the cultivation of wheat, and its external commerce, lately assured me, he knew that all sorts of corn would keep perfectly sweet above 2 years in the mow, if preserved from *rats and mice* ; whereas it could not be kept one fourth of that time in England, perfectly sweet in barns or granaries.

I have often been much mortified, to hear not only the common people, but even those of a much higher class in life, who ought to know better, declaim against the exportation of corn, when at the same time there is not a branch of commerce more beneficial to this kingdom than the export trade of grain was for a number of years after the bounties took place. The universal confusion in Europe, by putting a stop to cultivation in some instances, and to circulation in others, makes the present scarcity of grain an exception to the general advantages, which, for above 70 years, have been constantly produced to this kingdom, after the bounties were given from the export corn-trade ; the wisdom of the legislature has never shewn itself in a higher degree than in its corn laws, especially by giving bounties, and what is called, opening the ports for the exportation of grain, *whenever there is an excess* of any particular kind.

The circulation of corn, also coastway, from one part of the kingdom to another, into the manufacturing counties, as well as

to foreign markets under certain restrictions, has produced the most beneficial consequences to agriculture: for since the exportation has been authorised by parliament, the farmer always knows before he sows his seed, that if corn should be cheap by a plentiful crop, still he is sure of a market that will more than pay him for his labor; and for this very efficient reason, it is supposed there is now twice the quantity of land in tillage, than there was one hundred years ago, before the bounties were given on exportation.

Another happy event has succeeded in favour of the poor, in consequence of these wise and provident corn laws, whatever they may erroneously think to the contrary: the price of wheat was much lower a few years ago, and had continued so for above 50 years, than it was prior to the year 1689, when the bounty was first given by parliament, as will evidently appear by the following tables: for this reason and the subsequent advantages which have ensued, I cannot but think, that next to our invaluable act of navigation, there never has been any other act of Parliament, so conducive to our national strength and consequence, as that for opening our ports in favour of the export of corn. Besides, there is a collateral benefit which is not generally attended to, but which is by no means inconsiderable; it employs a good deal of shipping coastways, and is a good nursery, in addition to many others, for our seamen; the great and noblest bulwark of our nation; and I have been informed by some experienced gentlemen in the sea service, that the best mariners are those that have been brought up to the profession in the coasting trade.

About 10 years after the commencement of the bounties, that is in 1699, the price of wheat began visibly to diminish, as by

that time the farmers were got into a fuller tillage of corn, from a confidence that they must always have a sale for it, at home or abroad, and wheat has ever since been at a moderate price, except in some few very short intervals; viz. only in 2 years out of 67 has it exceeded 3*l*. per quarter; in 1709 and 1710; most of the others, during that period, it has been under 2*l*. per quarter on the average, as will appear by the tables; and the more land is inclosed, the more will there be in tillage, and the more beneficial this commerce of corn will be to the kingdom: I have prefixed some of the years when wheat was at the highest prices, prior to the bounties in 1689, which appear in the first table.

I have also prefixed in the second table, the prices wheat was at for many years after the bounties were given, to the present year, commencing at 10 years after the act of parliament took place, because as I have above observed, it required sometime to elapse before the farmer (who is a cautious individual) can determine to fling more land into tillage, than he or his forefathers have been accustomed to do.

The reason why I have selected the prices of wheat at Windfor market, for a standard is, because the college at Eaton, has for almost time immemorial, been obliged to keep an annual register, on account of their baker and brewer, who are very materially concerned, constantly to attend the market days, before lady-day and michaelmas, and bring the prices of wheat and malt to the provost and fellows, who have it registered in the audit book, and it cannot be doubted, but they are taken with accuracy, because, according to those prices, their rents are settled for the current year, it being left only to the tenant's option, whether they will pay in wheat and malt in kind, or in money at the market price.

*Prices of Wheat in WINDSOR Market in different Years,
prior to the Bounties.*

	£.	s.	d.
Wheat per quarter in the year	3	16	8
	3	13	4
	3	5	0
	3	6	0
	3	10	0
	3	14	0
	3	8	8
	3	4	8
	3	0	0

These few abstracts shew at what high prices wheat was many years before the bounties.

The following tables are taken from the same audit book, 10 years after the opening of the ports, i. e. giving the bounties; that time, it is evident, the farmers were convinced of the benefit arising from them, and therefore it is reasonable to suppose their land was by that time in full tillage for corn, much beyond any former period.

The surprizing difference between these 2 tables, will at first sight convince every unprejudiced mind of the great value of this act of Parliament to the nation in general, and particularly to that useful body of men, the farmers.

*Prices of Wheat in WINDSOR Market, commencing 10 Years after
the Bounties were given.*

	£.	s.	d.
1700	2	0	0
1701	1	17	8
1702	1	9	6
1703	1	16	0
1704	2	6	6
1705	1	10	0
1706	1	6	0
1707	1	8	6
1708	2	1	6
1709	3	18	6
1710	3	18	0
1711	2	14	0
1712	2	6	4
1713	2	11	0
Wheat per quarter in the year 1714	2	10	4
1715	2	3	0
1716	2	8	0
1717	2	5	8
1718	1	18	0
1719	1	15	0
1720	1	17	0
1721	1	17	6
1722	1	16	0
1723	1	14	8
1724	1	11	0
1725	2	8	6
1726	2	6	0
1727	2	2	0
1728	2	14	6

1761	1	10	3
1762	1	19	0
1763	2	0	9
1764	2	6	0

	l.	s.	d.
1765	2	14	0
1766	2	8	6
1767	3	4	6
1768	3	0	4
1769	2	5	9
1770	2	9	0
1771	2	13	0
1772	3	6	0
1773	3	6	6
1774	3	2	0
1775	2	17	9
1776	2	8	0
1777	2	15	0
1778	2	9	6
1779	2	0	10
1780	2	8	6
1781	2	19	0
1782	3	0	6
1783	3	1	0
1784	3	0	6
1785	2	14	0
1786	2	7	6
1787	2	11	6
1788	2	15	6
1789	3	3	2
1790	3	3	3
1791	2	15	6
1792	2	13	0
1793	2	15	8
1794	2	14	0
1795	4	1	6

Wheat per quarter in the year

was at

The accurate and ingenious author of the collection of papers relative to the corn trade, (from which I have received much information) says: — "Wheat has been considerably cheaper on

the whole, since the bounty has been paid, and continually on the decline, notwithstanding the export has continued to increase, and there is reason to believe, bread made of wheat is become more generally the food of the laboring part of the people than before the bounty was given." And he makes the average reduction on the price of wheat to be 7s. 9d. per quarter for the last 79 years; which I think is a convincing proof of the advantage of this law. It clearly proves also that tillage hath been thereby so encouraged and augmented as to make wheat much cheaper at home, and at the same time bring large sums of money into the kingdom for the corn exported, of which clear and distinct accounts have been laid before Parliament.

The average decrease subsequent to the bounty is nearly 8s. per quarter, excepting only this last extraordinary year*, and even this very year when wheat has been said to be so very dear, as yet (Feb. 20, 1793), it has not surpassed 3l. 6s. per quarter at Bear Quay, though for many years antecedent to the bounties it was some years at 3l. 14s. at 3l. 13s. and 3l. 10s. per quarter. Indeed it is something wonderful that this year wheat should not have arisen to much higher prices, when we consider what resources for the supply of it in Europe are now cut off, by the calamities of war. The immense magazines at Rotterdam and Amsterdam are also all devoted to the single supply of France; and the cultivation of the rich arable fields of Poland has been suspended by the civil wars of that unfortunate country, and much-to-be-lamented people. However I cannot join issue with many unreflecting individuals, who indiscriminately cry out against the war carried on by Great Britain, as the *sole cause* of the dear-

* This Treatise was finished in March 1793!

ness of wheat, and other provisions. But every unprejudiced mind must reflect, that the war, whether we had engaged in it or not, would have raged on the continent of Europe, and therefore the same *general scarcity* could not have been prevented by our neutrality; but, on the contrary, the deficiency of provisions in this country would have been greater had we not engaged in the continental war: however paradoxical this assertion may appear at first sight, it must be granted as an undeniable fact, and for this very efficient and incontrovertible reason, that out of 100,000 men and upwards which, it is supposed, have, in one capacity or another, been employed abroad from this country, a very inconsiderable part only have been nourished by the provisions sent from this island to Germany; therefore had we not engaged in the contest, our scarcity in England would have been still greater.

I presume every unbiassed mind will be convinced, from what has been above related, that it is a palpable prejudice, to suppose the opening the ports for the extraction of corn, is otherwise than highly commendable, under the parliamentary restrictions, and of great national benefit, as every augmentation of our stock in corn must always be, and therefore the more of it is preserved from the devastations of *VERMIN*, so much the more will the profit be to the public at large.

It is incontestably proved the poor have wheat much cheaper, by the excellent law above alluded to, and much more of it, than they could formerly afford to purchase before the bounties.

Secondly, it is proved that tillage is infinitely more general all over the kingdom.

Thirdly, it is also proved that the poor eat more wheaten bread, from its plenty and moderation of price, than before the opening the ports. In fact before the laws relative to the corn trade took effect, the poor almost all over the country eat bread principally made of barley, rye, or oats; of course their nourishment now is more substantial, more palatable and more reasonable in price. With all these advantages the poor are certainly in a much better state than 100 years ago, more especially because the most essential part of their livelihood is cheaper and better, and their daily pay is higher in proportion; for the provisions of the laboring poor have not mounted, but decreased, in their value since the bounties, as is already proved by the annexed tables; for wheat, their principal food, has been much cheaper since that period, and it is generally conceived, that the wages of the poor have been raised from 6 to 11 shillings a week: and if we carry our examination more accurately into all the real necessities of life which the laboring people want, we shall find none of them but very inconsiderably increased, at least by no means in proportion to the augmentation of their wages*. However I fear one thing has but too much increased amongst many of them, I mean *the love of liquor*; of course a too great neglect of their daily labor. Were three parts out of four of the public houses suppressed, it would be a real blessing to the poor, and a valuable incitement to industry, that heart-felt comfort of every honest man.

As the very judicious three tracts, published on the corn-trade in 1766, are now become exceedingly scarce and out of print, I

* It will be observed that the text answers for no later a period than a few years back; since that period, a growing population, an increased luxury, and other causes, related in this treatise, have acted unfavorably to this mode of reasoning.

shall occasionally make such further abstracts from that accurate collection as may be useful to the public, especially as they strongly corroborate many reflections I have made on this important subject.

In the wise observations by this author on the temporary high prices of corn in 1755, (in fact it was only an apprehension for a few months, nor was there any actual scarcity, for before Midsummer wheat got down to 1*l*. 13*s*. 10*d*. per quarter in Windsor market :) He says "Our Agriculture has been so immensely improved by the wise institutions of bounties on corn exported, and the extension of the corn trade abroad has been so great, that when the markets are high, large additional quantities soon come to market; for the very apprehension of a free import of foreign corn, or the appearance of a few cargoes in our ports, will induce all the hoarders of foreign grain, whether farmers or dealers, to bring it out to market, and of course the prices will be lowered for the poor."

"This is another beneficial consequence of the act alluded to, as it is always an impending terror hanging over the head of those avaricious commongers, who think of nothing but their own exorbitant gains."

The author of the Considerations on the Corn-laws co-incides with the above-mentioned judicious author, who has made such able strictures on the high prices of wheat, and I make no doubt but every reflecting mind will perfectly accede to the same opinion. He says "All that can be done by the Legislature in this matter is, to frame their laws so as to prevent grain from being at any time, either so dear that the poor cannot subsist, or so cheap that

the farmer cannot live by growing of it, which hath been, or at least should have been, the general view of all governments in their corn-laws; and no regulations that have been made in any country, in regard thereto, can have answered these ends better than those established in these kingdoms; which are in general, the permitting an importation at a low duty when dear, and by a high duty prohibiting it when cheap, and at the same time in order to the encouragement and increase of tillage, giving a bounty on the exportation, and securing the property of all persons who shall trade therein for that end."

The same author also says, "It appears that under the present encouragement, restrictions and regulations, relative to the exportation and importation of corn, most of which have now subsisted 70 years, that commodity has been as cheap, and wheat in particular cheaper than before they took place: it may be fairly concluded, that to them such cheapness has been owing, and therefore both the one and the other should be allowed under some such encouragement, restrictions and regulations as are now subsisting."

Had not these wise institutions been passed by the Legislature into a law, the laboring man could not afford to live as he now does; for it is generally supposed he lays out more now per week in wheaten bread, than he did formerly for rye bread, which latter, before the bounties, he principally supported himself and family upon.

There are many forcible proofs to be advanced in favor of the export trade, which shew what astonishing benefits the nation has received from exportation; several I have mentioned above, but

the following, which I believe has never before been hinted at, is as convincing as any. In the year 1750 it appears by the accounts laid before Parliament of the bounties given of wheat alone, without reckoning other corn, there were 1,500,220 quarters exported, and yet the following year, as appears by the register of the audit book at Eaton College, the price of wheat in Windsor market was only 1l. 18s. 6d. per quarter.

How great a gain must this be in specie to the kingdom, without the least injury to the poor? How strong a motive for the farmer to extend his tillage in grain? How strong a proof of the great utility of the corn trade? Ought we not therefore to increase our arable lands as much as possible, take every care to preserve that precious gift of corn, which Divine Providence so bountifully dispenses over this fertile island?

The ingenious author of the Tracts on the Corn-trade makes the annual growths in the kingdom:

Of wheat, 4,046,603 quarters.

Of barley, 4,603,272 ditto.

Of rye, 1,046,603 ditto.

Of oats, 4,250,947 ditto.

Different speculative farmers vary in their ideas about the necessary quantity that is reserved for seed; some make it a tenth, others a twelveth, and others a sixteenth; this reserved sort of corn always bears a higher price than what is sold for consumption; and what is very remarkable, these execrable little gluttons the rats know how to select the best sort from that which is less valuable, and never begin upon the inferior till they have devoured the most prizeable.

The various accounts I have received from different parts of the kingdom of the devastation of VERMIN I have above related; when united, they are as follows:

From Suffex a sixteenth part of the growth devoured by RATS KILLED, probably much more by those that *escaped*: vide Sir Richard Hotham's letter.

From Hants and Wiltshire, from different individuals, an eighth.

From Devonshire an eighth, vide Colonel Taylor's letter; and from a variety of persons in this county an eighth.

From the Somersetsshire Report to the Board of Agriculture, only a thirtieth from rats and birds, which appears too small a proportion, as some of the others appear too great; though this Report says the depredations by *vermin* are *too important* to be overlooked, and that farmers ought to make their slaughter a *general concern*.

From the Gloucester Report no definitive quantum is aimed at, but it supposes a *great deal of mischief is done by vermin*, and that the extirpation of them would be a *national benefit*.

Taking the aggregate of all these conjectural reports, we have reason, with some degree of propriety, to suppose that A TWELFTH of the produce is destroyed by VERMIN.

On these data, supposing the annual growth to be as above stated, the annual loss will be as under:

	Quarters.	Av. Price per quarter	Value,			Prest. Price per quarter	Value.
		s.	£.	s.	d.	s.	£.
On wheat,	337,216 $\frac{1}{2}$	50	843,042	5	10	72	1,213,980
On barley,	383,606	24	460,327	4	0	40	767,212
On rye, -	872,16 $\frac{1}{2}$	28	122,103	13	0	44	191,877
On oats, -	353,412 $\frac{1}{2}$	22	388,753	9	6	30	530,118

Supposed annual loss, £.1,814,226 12 4 £.2,703,188

OBSERVATIONS

ON

Forests, Common Fields, and Wastes.

NOW I am discoursing on the important subject of agriculture, which claims the protection and favor of every gentleman of landed property, I shall beg leave respectfully to fling out some loose hints, for others more able to improve upon, and to accelerate the good intentions of those in power, to whom I mean to shew what an immense loss is sustained by the kingdom (besides the devastations on all grain by VERMIN), from the neglect of enclosing our forests, as well as our common fields and other wastes, especially the former.

My principal landed property joins the two forests of Hants and Epping in Essex, and as formerly I had uninterruptedly resided there many years, when my ever-to-be-regretted and respectable friend, the late Marquis of Rockingham, came for the last time into the administration of this country, he was induced to think I might collect such materials, as might be useful in case of an enclosure, which he very laudably had much at heart to

extend over the whole kingdom: but, alas! just before his lamented death, I delivered him my imperfect plan for the enclosure of those vast tracts of forest land near me, and gave him every information I could collect on that very important subject. He was pleased, from his partiality, more than the merit of the plan, to approve of my imperfect ideas; but his unfortunate death succeeding soon after, I was precluded shewing my further attachment to my invaluable and respectable friend, or my zeal and attention to this long and sadly-neglected part of our national agriculture.

These cursory hints not having been found in Lord Rockingham's office, (though they were known to some of its members) I was applied to by a worthy friend of mine, high in the estimation of the succeeding government to his Lordship's, to let him have a copy of my hints on the subject, in order to communicate them to the new administration, which I readily acceded to; but I never heard any thing further of their fate. I only recollect, that not long after, when I went to my house in Devonshire to reside, I heard Enfield Chase was enclosed, but not according to my plan. I heard also, some time after it was discommoned, that Government were much disappointed in their expectations. Perhaps my having resided for these last 12 years principally in Devon, prevented me the honor of being at all consulted on this subject: I can only say I should have been happy to have communicated my mite of intelligence on this very interesting object, had I been applied to, and as I have always kept a considerable part of my Essex estate in my own hands, and of necessity obliged to pass a few months there every year, I might perhaps have started some few ideas not quite unworthy of notice.

of an enclosure which he very handsomely had much in hand to

I am sorry this valuable undertaking has been suspended for so many years; many beneficial improvements might long since have taken place, and I confess I cannot penetrate so far into the statute laws, or even those of equity in the kingdom, as to be convinced of any great or insurmountable impediments attendant on this much to be wished for improvement: I am sure it is greatly to be lamented that so much land, the cultivation of which would be of such importance to the public, should lie in a manner dormant to every good purpose; it is but too visible to every observing person who resides near these forests, that they are now only nurseries for the most detrimental, and often the most abandoned, purposes.

The numberless poor and indigent who inhabit the precincts of these forests, pretend to have, and actually do enjoy, an unlimited traditional right to depasture all sorts of cattle (except sheep and hogs) the whole year without stint, saving for fence month, and they look upon themselves as much proprietors of these extensive domains as any freeholder or farmer, let his condition be ever so respectable; but as they have seldom any capital sufficient to buy live stock, beyond a sow or some geese, (for it is seldom they can arrive at the purchase of a cow or a horse) they nevertheless swindle out a miserable livelihood from these forests, for they have no right to cut wood, nor graze pigs on them, nevertheless these trespasses are shamefully winked at, and the grass on the forests rooted up and destroyed, without the Verdurers, the Ranger, or any of their numerous tribe of officers, taking the least pains to prevent it; and by their neglect the vert and the wood are constantly going to decay. It is melancholy to ride over these forests, and see such numbers of oaks pollarded, and of course rendered useless for any other purpose than fuel, and producing

once in a dozen years a few faggots of very inconsiderable value; whereas had they been left to grow in a state of nature, they might have produced fine timber fit for our navy.

My bailiff and myself took a quarter of a mile square in the thickest part of Epping Forest, and the same in the thinnest part; and we observed the same measurements in Hannault Forest, and I am sorry to say how we found the proportions, which were as follow:

In Epping Forest, - - - 302 pollards

Ditto, - - - 53 speer oaks only

In Hannault Forest, - - 527 pollards

Ditto, - - - 128 speers

It is to be observed that all oaks that are pollards are supposed to belong *not* to the King or the nation at large; but the freeholder, the subordinate Lords of manors, the Ranger, or his tenants, pretend to have the property of them. This accounts for so many pollards growing in the royal forests, which are clandestinely made so; for it is a very easy matter for a farmer or a cottager to cut off the head of an oak in the night, which immediately deprives the lawful proprietor of his right; but the mischief does not end here, as it is a very common thing to see some of them gradually undermined at the roots for three or four days together, and then they are furtively purloined away from the spot in the night, and the place they stood upon levelled and made plain.

It is almost the constant and daily occupation of the children of the poor inhabitants to go to and fro from the thickest parts of

the wood, loaded *not* with dead branches, but with live ones of oak as big as they can draw after them; a sad idle pilfering occupation for the infants of illiterate parents, productive not only of bad consequences to the public, but to the individual himself, often fatally so: from this constant idle practice the children soon learn to pilfer other articles besides wood; and from stealing small things, proceed to greater, till they generally end a sad mispent life at the gallows.

How different would be the life, conduct, and morals of all such idle indigent individuals, if each had his proportion of land; and I should always wish the poor to have a certain and even a partial allotment. They would probably become honest, industrious, and useful members of society; they are really now to be pitied, because they have been brought up in these wicked courses, and are ignorant of the great injury they are committing to themselves, their posterity, or their country. Happy will be that Minister (and I think we now have such a one) who exerts himself in opening the eyes of these poor deluded people, and who, by effecting the enclosure of these desolated wastes, forces, as it were, their indigent inhabitants into the paths of honesty and comfort, and thereby to a sense of the enjoyment of real happiness.

In the minutes I made, during the pursuit of my inquiries for Lord Rockingham, I thought it might be reasonably conjectured, that taking the whole of the forests of Hannault and Epping, which consist of many thousand, I may say, tens of thousand of acres, the community at large are not benefited above 2s. per acre; whereas if the land was apportioned in due allotments, and in a proper state of cultivation, the worst, on an average, would be

worth from 15s. to 25s. per acre per annum, the middling from 30s. to 40s. per acre, and that many thousand acres, such as Fair-Mead bottom in Epping Forest, and the meadow land about Fairlop in Hannault Forest, would be worth 50s. per acre, perhaps more. I have examined the staple of land in many parts, and find in most a rich loam, many inches deep; and from some old title deeds belonging to my estate, there is the greatest reason to conjecture that even marle is to be found on the forest, which would prove a valuable substitute for dung, which is now one hundred and fifty per cent. dearer than it was twenty years ago.

I think I have pretty clearly proved, only from the above slight relation of facts, what a vast benefit the kingdom has experienced for many years past, from giving bounties on the exportation of grain; therefore this excellent institution is proved beyond the possibility of a doubt to have been highly beneficial to agriculture, by greatly increasing the tillage of corn, and of course producing plenty. From these clear and evident facts can any rational being suppose, but that the cultivation of our forests, our common fields and waste lands, must act in the same lucrative mode as the bounties have done, or that any thing would more contribute to the benefit of the poor and the public?

The productions of the soil, when naturally fertile and duly cultivated, I presume are the principal riches of a country; corn is easily raised in our island, and is that commodity we cannot have too much of, because when it is exceedingly cheap, by opening the ports we know there is the world for a market, and the farmer will never fear getting rid of it at a price always superior to his labor.

All the commodities of our manufactories have a limited trade, but our corn will be ever consuming by all Europe at large, when it does not want our linens or our trinkets* ; let us therefore encourage and increase our tillage in every laudable shape possible, and I doubt not but under His Majesty's gracious auspices, and the present ingenious Board of Agriculture, it will be carried to the greatest perfection.

I cannot nevertheless help thinking; that some abuses are crept into husbandry, which militate greatly against the cheapness of two different sorts of meat, I mean beef and mutton, the very offals of which are of so much consequence to the poor: therefore, if the correction of this evil can be accomplished by the wisdom of our Government, it ought to be done; at least the excess to which this abuse has been carried for many years past, deserves the serious interference of the Legislature; it is an object not unworthy the present Minister, who seems to feel strongly for the comforts of the indigent, and therefore I doubt not but this and all other similar abuses which so materially affect the poor, he will kindly and warmly exert himself in reforming.

It is almost beyond comprehension the quantity of calves and lambs that have been fatted of late years in Essex and Herts, and in the counties of Wilts and Dorsetshire, and these principally for the metropolis. The luxury and riches of the times but too

* It is inconceivable what immense quantities of all kinds of trinkets and Birmingham wares of every denomination are annually exported from England to Italy, particularly to Venice: from thence they are carried to the great fairs of Ancona and Senegaglia, and there a surprizing trade is carried on by what they call *Baratto*, chiefly by the Jew and Armenian merchants, who bring precious stones to traffic with, and dispense these English trinkets all over Persia and the East.

powerfully encourage such mischiefs, by which these young animals destroy, in the space of a few months, as much milk and hay, to fit them for market, as would maintain them to almost their full growth: but even this would be much less felt, by having so great an increase of all sorts of provender by the inclosures I have above spoken of; and I am very happy to find my opinion sanctioned by the judicious author on the price of provisions in 1773: he says, "It will be said that the waste on the rich man's table, and the corn consumed by his horses, would feed many hungry mouths; I allow it; but the evil points out the remedy; for if it is the real fact, as I believe it is, that the consumption is greater than the produce, *cultivate more land, and suffer not barren acres to stare us in the face, when we are crying out for bread.*" This excellent author, in another part of his treatise, says, with a spirit highly commendable, "I shall not scruple to point out, as the first necessary step to be taken, in order to procure plenty, the inclosing and parcelling out all the King's forests and chaces; let corn supply the place of those miserable pollards, and let flocks and herds supplant the half-starved deer which prowl about to tempt poor wretches to the gallows; for it is deer-stealing that induces those who are born on forests and chaces to lead an idle life, which corrupts their morals, and makes them the terror of every honest man in the neighbourhood; their example also corrupts many who might otherwise probably be useful industrious subjects. By this a Minister would entail immortal honour on his administration, at the same time the poor would be employed and fed, and the coffers of his royal master would be filled."

The celebrated Mr. Evelyn, in his *Sylva*, supposes there are 200,000 acres of land in the forests, and that one half might be converted to meadow, and the other to arable; but his calculation

I always thought erroneous, as I had reason to suppose our forests of Hamault and Epping are little short of 30,000 acres, and they make inconsiderable parts of the whole.

I cannot help dissenting from this able author upon the method he proposes in his *Sylva*, on a supposition of an inclosure of the forests: I fear his knowledge and partiality towards his favorite object, the preservation of forest timber, has biaised him too much, and that he has extended his study to that part of agriculture, to the neglect of the other departments, perhaps more noble than that of woods; besides, he might have been but superficially acquainted with tillage, and erroneously sacrifice the wheat-sheaf to the spreading oak, or he never would have recommended so strange a division of the forest lands in case of an inclosure.

He proposes that the timber trees for the use of the navy should stand isolated at certain distances from one another in the corn fields, and be benefited by the plough, or in hedge-rows. Mr. Evelyn must be very little acquainted with the nobler branches of agriculture, which belong to raising of grain, or the management of natural or artificial grasses, to make such a proposition; for though I admit, with him, that forest trees would be benefited by ploughing round them, for the admission of nitre and other subtle particles of the air useful for every kind of vegetation, yet the ploughing in this instance would be an expensive operation of no use but to the trees, as every farmer well knows that corn of no description will ripen under the shade of trees, or be worth collecting, and their shade would almost prevent either natural or artificial herbage coming to strength and maturity, which it never attains till it produces its seed, and in the shade that is impossible: I know of but one example to the contrary, and that I shall men-

tion, from the following observations I have made upon *lucern*, a most valuable plant, too much neglected in England, though so ably recommended by my ingenious friend, Mr. Balwin, of Clapham, whose knowledge and experiments in other branches of agriculture do great credit to his judgment and penetration.

When I was last in Germany and Italy, about three years ago, I discovered, with much satisfaction, this sort of artificial grass luxuriously growing under the shade of different trees. In Italy, it is common, and there called *erba spagnia*, and grows spontaneously near Florence under the mulberry trees. Had I only seen the prolific nature of this grass in Italy, I should have supposed the warmth of that climate principally conducted to its abundant vegetation under the shade of trees, but when I found it also growing luxuriantly under them in divers parts of Germany, I was convinced that the shade was not hostile to it: it is termed by the Germans *immerwehrend*, that is everlasting, probably so denominated from its everlasting quality; for after the third year from its seed, it may be cut 3 or 4 times in the summer, if kept free from weeds; and as most artificial grasses perish in 3 or 4 years, this, then becomes in full vigour. About 5 years after its first introduction into England, I sowed one of my fields in Devonshire with it, about 12 years since; 4 years ago I wanted to convert that inclosure to another kind of tillage, but with every exertion to extirpate this plant, I have not yet been able to expel it from the soil; which shews what great vegetative powers it is possessed of: indeed, the formation of its roots are by nature calculated to receive every kind of nourishment that the good staple of the ground can give, as well as every kind of humidity it produces, for there are many horizontal roots that shoot out into the best part of the land, which is always near the surface, and a fur-

prizing tap-root, where it meets no resistance, as in a sandy soil, will penetrate many yards deep into the earth, and from the great nourishment it receives from this prolongation of its main root, it affords these frequent cuttings; but what is very extraordinary in this plant, though it appears of a very succulent nature, yet it is uncommonly heartening for horses, who require very little corn even in the hardest work when used to this green provender, which, unlike other herbage, does not relax the body, but passes principally by urine, nor does it ever produce flatulency in horses.

At first sight, perhaps it may be said, my experiment above-mentioned, proves too much, as no man can be supposed to fill his ground with a plant, which appears to take universal possession of it, in spite of his wishes to exchange it to some other culture. But in answer to this, no reflecting farmer (and most of them have that cast of mind) will introduce this plant, without first duly considering its nature and good qualities, and he will probably wish never to change the culture of his land when he finds it produces such an abundant and useful herbage, without manure, without risk, and with very little labor.

Not far from Mayence in Germany, at a place called Oppenheim, *lucern* grows very well, not only under apple and pear trees, but even under walnut trees, where scarcely natural grass will ever thrive, or be of any use as provender; in other parts of Germany I have seen the lucern (which the botanists, according to Linneus, call *medicago sativa*, others *erba spagnia*, and *herba media*,) grow in great vigor, in a cold, miserable, sandy soil, similar to that of Bagshot heath, and other uncultivated extensive tracts in many parts of this kingdom, not unlike that of Dartmoor and Haldown in Devonshire: I have mentioned these circumstances to shew,

that if we attentively and kindly court nature, she will scarcely ever disappoint our labor; but we must study and find out what seeds are homogeneous to her different soils, and we shall certainly obtain from them some profitable productions, useful either to the human or the brute creation; and plenty, let it be what it will, may generally be converted to good national purposes.

From the above particulars which I have mentioned, relative to *lucern*, it appears we may adopt Mr. Evelyn's wish for the growth and preservation of timber trees in no inconsiderable degree, and nevertheless have a very profitable production under the shade; but there will not be found one good practical farmer, who will admit of corn being cultivated under trees; but in the *lucern*, we have a very useful artificial grass, that will flourish in the shade of almost any tree, and grow nearly in contact with their branches, without being injured; besides, as the best mode of cultivation of this valuable plant, is to sow it in drills; the trees may receive the frequent advantage of ploughing under them with the drill-plough, which will be equally useful to the *lucern*, because it ought to be kept quite free from weeds, which this trifling operation will effectually do.

I shall here take notice, in this cursory tract, of a few general errors, which, as far as their influence extends, are discouragements to the farmers increasing their tillage, and which it is much to be wished, could be rectified.

There is a false idea, even amongst men of good sense and tolerable penetration, that we grow sufficient corn to answer our national consumption for 2 or 3 years; I have even heard it asserted, some few years ago, by respectable persons, who ought to know

better, or not advance such a prejudice, that our produce in one year is sufficient to serve the demands of four: in some particular counties this may perhaps sometimes happen, though I suppose not often, and this may appear plausible only where grain is the sole production; therefore it is only a local abundance, and by no means proves that the whole kingdom does the same on an average; the ingenious author on the corn laws supplies us with a very excellent reflection on this point, in contra-distinction to this error. He says: "we had 10 as good years, from 1741 to 1751, in succession, as ever was known; but where was the corn seen? let us reflect on the appearance of stacks, and fullness of barns after harvest in every year, and then say, where such a quantity could be concealed." This, but too vulgar an error, may influence many a cautious farmer, not to increase his growth of corn.

There is another mistaken notion almost universally received, that it is contrary to the law of the land to sell corn in market *by sample*. The very idea is a reflection on the wise legislature of our country, to suppose it would subject a farmer to the risk of bringing a load of wheat, or any other grain in a great bulk, to a market town, upon an uncertainty of selling, and perhaps through bad roads; and then if the sale should be slack, and below the value of his labor, he must be exposed to the necessity of returning back with it at a great loss. This error is founded on a misrepresentation of the act of Parliament, relative to forestalling, which, however, is very clearly and decidedly expressed, and pointedly says, "*Forestalling corn or any commodity, is the buying any thing coming to market, or before the same be in market, or the persuading persons coming to abstain;*" but not the least mention is made of selling by *sample*: in short, every visible and certain object that prevents the farmer receiving all reasonable profits for his corn,

should be carefully done away, and every minute article liberally cherished, to assist his honest dealing, and to encourage his laborious exertions.

There is another exceedingly troublesome, and even unjust, impediment to the dealers in corn, as well as to many other merchants who employ very considerably our coasting vessels, in a variety of different commodities, and which requires the friendly hand of Government to remove; I mean the great unnecessary expences of cockets and bonds, which are attended with needless delay, and greatly retard our navigation: there have even been examples wherein, from the neglect of sending the proper certificates for the relieving those bonds, some mariners have been ruined by prosecutions, though there does not appear the least necessity for such securities. As my house in Devonshire is close to the seaport of Teignmouth, I have known but too many instances, where the captain's being obliged to go to Exeter, and back again, near 30 miles, for these cockets, have incurred not only great trouble and expence, but have lost their voyage by change of wind, to the no small detriment of themselves, and the proprietors of cargoes, when at the same time these cockets might have been granted equally well at the Custom-house at Teignmouth.

Before I sum up these imperfect cursory remarks, I cannot help adverting to some other vulgar prejudices relative to the corn trade; nor is there a more general error amongst ignorant people, (unfortunately they constitute 5 parts out of 6 of the community) than that of railing against the rich farmers for hoarding up their corn, as they call it.

Let us examine this circumstance a little below the surface, and

see how this fact really stands : I think we shall find it a blessing to the public, that these avaricious hoarders up of grain, as they are unjustly termed, are enabled to do so. Without entering much into the detail of the different degrees of condition and substance of farmers, I shall only advance a few facts well known to every husbandman ; first, that the poor farmers are many, and that they are obliged to thresh out, and sell their corn by Christmas, to pay their rent.

Secondly, the moderate farmer can afford to save a *part* of his corn only, which, if the succeeding season has not a favorable appearance, he is sure to have a better price for, than those poor farmers who are necessitated to sell, to pay their Christmas rents ; but still this moderate farmer must sell before his next half year's rent becomes due at Midsummer, for he cannot afford to hoard it up any longer.

What does the rich farmer do who can afford to keep all his corn ? He watches the markets, threshes out when he pleases, and sells when he likes the prices ; therefore in what capacity does he stand before the public ? Why, though he sells at something a higher price than the poor farmer at Christmas, and the moderate farmer at Ladyday or Midsummer, yet, he sells between Midsummer and Christmas, or at farthest, Ladyday following, when the other two descriptions of farmers have no corn to sell ; and if there is an appearance of a bad crop, he still continues selling, for fear importation should be allowed ; and if there is an appearance of a good crop, he still sells for fear of the price falling too low, or that the bounties should take place : therefore, the rich farmers, who are but few, actually stand in the place of a public

granary, and in this capacity they are to be respected, as they are exceedingly beneficial to the public at large.

The ingenious author above mentioned, speaking of this part of the rich farmer's station, says, "*the waste made by vermin makes their expences in keeping very great, and frequently forces them to market sooner than they otherwise might intend to do.*"

In this point of view, the prepared flates might be used as effectually to the barns as the *safe-guard* to the mows, and prove of great utility to the corn-dealer to prevent his being forced to market when the price does not answer his wishes.

I have before expressed my entire disapprobation of public granaries, and I flatter myself the very substantial reasons I have advanced, will be convincing that my opinion is well founded, although it is contrary to the practice of most other countries in Europe, as France, Spain, Italy, and Germany, have their public magazines of corn. But I have strong conviction in my own mind, that in most of these states, such repositories of grain are not always applied to the best of purposes, for which they were *supposed* to be at first established; nor do I know any public granaries on the Continent (if they can be denominated as such) that are supported for real laudable intentions, besides those of Rotterdam and Amsterdam; these are great deposits belonging to individual merchants, not for the benefit of their country, but for the sole purpose of that great and extensive corn trade which is so profitably carried on by the Dutch all over Europe, for every one knows they have little corn the growth of their own territories; but they collect it for the object of their great commerce, and they trade to Poland by Dantzick, Riga, Archangel, Petersburg,

the Gulph of Finland, and other parts of the North, and from these countries they extract immense quantities of wheat and other grain; and it is well known that Amsterdam has very frequently supplied France, Spain, Portugal, and even Italy; the standing stock of wheat at Amsterdam alone for the sole circulation of that trade, I have heard to be estimated at 400,000l. value.

But this is not the case with the public granaries in other states on the Continent; in one great and populous metropolis, I was present where it was universally received as a fact, that the sovereign of the country and the minister had formed a coalition to sell out the corn in the magazines to the public, and even to the poor, at an enormous profit during a time of scarcity; add to this the immense loss sustained by *vermin* and other damages, all of which fell on the public at large.

If one government is capable of being guilty of such cruelties and iniquities towards the poor and the public, it is natural to suppose, that others in Europe of equal despotic principles, will act in the same manner.

From what has been advanced above, we must conclude, that the rich farmers are a very valuable body of people to the nation, as they actually and virtually constitute the best possible granaries for the benefit of the community at large, and risk all the loss by *vermin* and other injuries; I only wish we had more wealthy farmers of this description to hoard up corn for the public.

The ingenious author I have above alluded to, speaks very decidedly in favor of the farmers being the best guardians of the corn for the use of the kingdom, in contra-distinction to public

magazines, which he as much deprecates as myself, and pointedly takes notice of the wisdom of our legislature, which empowers all persons to buy and lay up corn ; he says, " in consequence of this, many subsist by *storing* up the excesses of corn at their own risk, and the public have seldom any necessity to take the least care about it, and were never yet, at least since the act for the bounties has passed, obliged to form magazines, which, if ever they should be forced to do, might become a very great discouragement to tillage and the corn trade, and in the end make corn dearer than before ; as the farmer seeing large quantities collected together in one view, might imagine corn would never bear a price for the future, and the fear of the market being spoiled by the magazines being opened, would prevent all private persons from keeping a sufficient quantity by them to carry on their business with profit, and consequently the trade would decline, or be in a manner left off, which might be attended with many other ill consequences, at present impossible to be known or foreseen ; neither can that care be taken to preserve corn from corruption and decay, *or being diminished or destroyed by vermin* in such public magazines as in private hands, and consequently the goodness of the quality cannot be so well preserved, for they will seldom be emptied more than once a year ; and all who know the corn trade, know how difficult it is in this climate to preserve corn sweet, after it is out of the straw, the whole year round."

We cannot have a stronger proof of the fatal effects of *prohibiting the exportation of corn from a country* that has excesses, than in the well-known circumstance which happened about fifty years ago in the Turkish empire, and which is related at large in those excellent tracts on the corn trade I have above so often alluded to.

On there being a very plentiful crop in those fertile and extensive domains belonging to the Grand Signior, the Visir then at the head of that government, who was not only a good, but a sensible man, very wisely allowed a general exportation of this grain, and the abundance was such, that the purchasers shipped it at Smyrna at 11s. 4d. per quarter, and many hundred vessels were freighted with it. The janizaries and the common people seeing these public transactions, supposed they should all be starved, and became so riotous, that nothing but the strangling of the Grand Visir would appease them. His successor pursued the opposite conduct, and prohibited all exportation in future, the consequences of which were so fatal, that the farmers being convinced they had lost their sheet anchor on excesses, almost totally neglected their tillage, so that the next three years wheat sold in Turkey for 21. 8s. per quarter, an enormous price never heard of before in that prolific country, and the distresses of the poor were so great, the evil was scarcely at all remedied for many years; nor has there been ever since that plenty in the Grand Signior's dominions, which there used to be antecedent to that period, and to this day the fate of the poor Visir is lamented as that of an unfortunate good man.

During my former residence in Italy, I was well assured there never had been a scarcity of corn in Lombardy ever since the introduction of the Turkey wheat, which at that time had been cultivated there above seventy years, and that prior to the cultivation of this very valuable grain, that country was subject to a scarcity once in nine years at farthest; it is a remarkable heartening food, and uncommonly wholesome, when made into a kind of pudding, called by the natives *polenta*; in fact, it is esteemed so very salutary, that the medical gentlemen in the Venetian flat

recommend a *polenta diet* as the best and safest cure for hectic and consumptive complaints; add to this, it is a very palatable food, as well as very nutritive, and a strong corrector of acids.

This Turkey wheat is a finer sort of wheat than what we call *Indian corn*, and may be cultivated very easily in this kingdom; I have tried it to the greatest advantage in Devonshire, according to the method used in the Veronese and Paduan states, and shall at any time be glad to send a copy of its cultivation to any one who wishes to make the experiment.

I have herewith subjoined a table of the waste lands in the kingdom, drawn up for the consideration of a committee of the Board of Agriculture in January, 1795, which I thought might be useful, and not unentertaining to the reader of these remarks to have resort to; though not perfectly accurate, yet it will shew what an astonishing quantity of uncultivated soil must exist in this island, which, though at present of little utility to the public, yet the greatest part might be made productive, become a blessing to the poor, and of the highest concern to the wealth and strength of the nation.

From the experiments I have made on my own estate in the clearing of woodlands, a probable opinion may be formed of the best mode, as well as the cheapest, of rendering such land fit for culture. I have experienced the different modes of preparing it for the immediate reception of any kind of seed.

The method most commonly practised, is by cutting down the underwood, grubbing up the moors, and then ploughing up the land with a large plough, with 8 or 10 horses, and finally, by

ploughing it again with a common plough. This method I not only found defective, but more expensive than the following, which I have adopted. The expences attendant on the first mode were not only greater, but the process was also less efficacious, for by using the great plough for ripping up the remaining moors, which the stubbing up could not eradicate, it was necessary to plough so deep, as to pass through the good staple of the soil, by which the clay, chalk, or gravelly earth, which ever kind the land partook of, was by that means intermixed with the surface and good part, and it was rendered much less proper for the vegetation of any kind of seed.

The second, and best method which I pursued, was by cutting the underwood, grubbing up the moors, and digging the ground all over, allowing a farmer 20s. per acre, besides the faggots and moors, by this means my land was in perfect order, without the good staple of the land being contaminated by the mixture of the lowest soil, for by digging with the spade, those roots which had perforated into the lower part of the soil, were easily drawn out by hand, when the ground had been disturbed by the spade as deep as it would go, and my land was ready for a crop of oats, or turnips the same year, as soon as the timber and bark was removed; and when the turnips had been eaten off by sheep, the land was ready for any grain, and this I presume to be the best method for preparing wood-land that has been recently grubbed up, for any kind of culture.

It is to be observed, that I sold the bark from my timber in the wood I had cleared for a high price, that it not only indemnified me for the expences of the additional 20s. per acre for digging, but enclosing, and enabled me to purchase 12 loads of dung per acre, to plough in with the land after the sheep had left it, the

result was, a fine crop of wheat, so that the timber on the premises was all clear profit. Had this method been pursued by Government on Enfield Chase, it would not have turned out so unprofitable either to the Crown or to the individual.

The profits that may arise from the sale of this work (which the partiality of my friends conversant in these sorts of publications, flatter me will be extensive) shall be applied to some charitable purpose, of which the public will receive a faithful account. However trifling and inconsiderable the emoluments may be, I am sure there is so much generous and charitable benevolence in most of my countrymen, that they will be well pleased, when they reflect, that they are contributing their mite of charity and comfort to the poor, in purchasing this little treatise. This unfortunate class of our indigent compatriots, we ought in our different spheres of life never to neglect, but always to comfort and assist to the best of our abilities.

General View of the Amount of Waste Lands in the Kingdom of Great Britain, including Downs, Forests, Commons, and other uncultivated Lands.

I. ENGLAND.

COUNTY.	Statement on what founded.	Distinction of Lands.	Numbers of Acres.
Bedford - -	Country Report, p. 11	Common and Waste Lands	108,500
Berks - - -	Ditto, p. 59	Forests and Commons	40,000
Bucks - - -	Ditto, p. 32	Wastes	6,000
Cambridge -	Ditto, p. 196	Wastes and Commons	185,300
Chester - -	Ditto, p. 8	{ Wastes including Peat } { Bogs, &c. }	60,000
Cornwall - -	Ditto, p. 56 and 57	{ Wastes including Furze } { Crofts, &c. }	505,656
Cumberland -	Ditto, p. 34	Wastes and Commons	492,000
Derby - - -	Ditto, p. 38	{ Wastes not employed, one } { third of the County }	239,492
Devon - - -	Ditto, p. 65	Waste Lands, one fifth Co.	320,000
Dorset - - -	Ditto, p. 5	Waste Lands	86,000
Durham - - -	Ditto, p. 43	Waste Lands	130,000
Essex - - -	Country Map	Wastes and Forests	28,500
Gloucester -	Ditto	Wastes and Forests	28,500
Hants - - -	Ditto, p. 32, 35, 41, 43	Wastes and Forests	188,650
Hereford - -	Country Report, p. 27	Waste Lands	20,000
Herts - - -	Ditto	Wastes	4,500
Hunts - - -	General Information	Wastes and Fens	20,700
Kent - - -	County Map	Wastes and Commons	2,220
Carried over			2,466,018

COUNTY.	Statement on what founded.	Distinction of Lands.	Numbers of Acres.
		Brought over	2,466,018
Lancaster - -	Country Report, p. 52	Wastes and Moors	108,500
Leicester - -	Country Report, p. 46	Waste Lands	20,000
Lincoln - -	Ditto, p. 112	Commons, Wastes, &c.	200,000
Middlesex - -	County Map	Commons and Heath	13,080
Monmouth - -	General Information	One fourth Waste	67,520
Norfolk - -	County Report, p. 5, 13	Wastes and Warrens	148,346
Northampton	General Information	Commons and Fens	45,000
Northumberland	County Report, p. 7	Wastes and Mountains	450,000
Notts - - -	County Map	Waste Lands, &c.	67,880
Oxford - -	Ditto	Wastes and Commons	37,880
Rutland - -	County Report	Waste one third County	50,000
Salop - - -	County Map	Wastes and Commons	131,612
Somerset - -	County Report, p. 22	Wastes, Commons, and Fens	100,000
Stafford - -	Ditto, p. 22	Waste Lands, &c.	141,760
Suffolk - -	Ditto, p. 19	Waste Lands, &c.	100,000
Surrey - - -	Ditto, p. 25	Commons and Wastes	96,000
Suffex - - -	Ditto, p. 95	Commons and Wastes	190,000
Warwick - -	Ditto, p. 37	Commons and Wastes	120,000
Westmoreland	Ditto, p. 6	Three fourths uncultivated	405,120
Wilts - - -	General Information	Wastes and Downs	200,000
Worcester - -	County Report, p. 17	Waste Lands	15,000
		Carried over	5,168,716

COUNTY.	Statement on what founded.	Distinction of Land.	Numbers of Acres.
York { East West North } Riding	{ General Information County report, p. 140 Ditto, ditto }	{ Brought over Wastes and Commons }	{ 5,168,716 254,588 405,173 442,000 }
Total Wastes and Commons in England			6,270,477

II. WALES.

Anglesea - -	County Report	Wastes and Commons	5,000
Brecknock - -	Ditto, p. 19	Wastes and Commons	256,000
Cardigan - -	Ditto, p. 30	Wastes and Commons	206,720
Caermarthen - -	Ditto, p. 21	Wastes and Commons	170,666
Caernarvon - -	General Information	One-third Waste	102,333
Denbigh - -	Ditto	One-fourth Waste	102,500
Glamorgan - -	Ditto	One-fourth Waste	107,200
Flint - -	Ditto	One-fourth Waste	40,000
Merionethshire	County Report, p. 12	One-third Waste	166,666
Montgomery - -	Ditto, p. 12	Wastes and Commons	250,000
Pembroke - -	Ditto, p. 21	Wastes and Commons	22,222
Radnor - -	Ditto, p. 16	Wastes and Commons	220,000
Total in Wales			1,649,307

III. SCOTLAND.

Aberdeen - -	County Report, p. 127	Unimproved Land	374,000
Carried over			374,000

COUNTY.	Statement on what founded.	Distinction of Land.	Number of Acres.
		Brought over	374,000
Argle - - -	General Information	Waste and Mountainous	787,733
Ayr - - -	Ditto	Moorish Districts, &c.	218,454
Bamff - - -	Ditto	Wastes and Hills	290,000
Berwick - - -	County Report, p. 10	Moor Mofs, &c.	126,000
Bute and rest of Hebrides }	Hebrides Report, p. 60	Moor, Wastes, &c.	2,880,000
Caithness - - -	County Report	Wastes and Commons	360,000
Clydesdale - - -	County Report, p. 71	Moors, &c.	250,000
Clackmana - - -	General Information	Wastes and Moors	25,000
Dumbarton - - -	Ditto	Wastes and Commons	164,266
Dumfries - - -	Ditto	Ditto	200,000
Elgin - - -	Ditto	Ditto	250,000
Fife - - -	County Report, p. 1	Hill, Mofs, &c.	64,000
Forfar - - -	County Report, p. 1	Wastes	71,870
Inverness - - -	General Information	Wastes	1,694,933
Kinross - - -	Ditto	Ditto	25,000
Kirkcudbright	Galloway Report, p. 1	Two-thirds Waste	366,734
East and West Lothian }	General Information	Wastes	55,000
Middle Lothian	County Report, p. 7	One-third Waste	76,800
Mearns - - -	General Information	Wastes and Commons	164,266
Navin - - -	Ditto	Ditto	10,000
Orkney - - -	Ditto	Ditto	700,000
Perth - - -	Ditto	Five-sixths Waste	1,321,600
		Total Wastes, &c. in Scotland	10,475,656
		Ditto, in Wales	1,649,307
		Ditto, in England	6,270,477
		Total in Great Britain	18,395,440

Errors excepted

FINIS.

